

**Disclaimer:** The views expressed are those of Paul Gipe and are not necessarily those of the sponsor.

**Disclosure:** Paul Gipe has worked with Aerovironment, ANZSES, APROMA, ASES, AusWEA, AWEA, BWEA, BWE, CanWEA, CAW, DGW, DSF, EECA, ES&T, GEO, GPI Atlantic, IREQ, KWEA, MADE, Microsoft, ManSEA, NRCan, NRG Systems, NASA, NREL, NZWEA, ORWWG, OSEA, PG&E, SeaWest, SEI, USDOE, WAWWG, WE Energies, the Folkecenter, the Izaak Walton League, the Minnesota Project, the Sierra Club, and Zond Systems, and written for magazines in the USA, Canada, France, Denmark, and Germany.

# Community Wind--The Third Way

## Wind Energy As If People Matter

1. Large Wind Power Plants
2. Small Wind Turbines
3. Locally-Owned Commercial Turbines



WindShare Meeting,  
Toronto, Canada

# Why the European Success?

- **#1 Community Involvement**  
Germany & Denmark
- **#2 Advanced Renewable Tariffs**  
16 EU Countries use Electricity Feed Laws

# Increasing Acceptance #1

**“Your Own Pigs Don’t Stink”**





# Why Community Wind?

- **Participation = Greater Acceptance**
- **Distributed = Greater Resiliency**
- **Clean & Green (Mostly)**
- **Human Scale**
- **Enables Local Ownership**
- **New Cash Crop For Farmers**



# What is Community Power?

- **Local**  
Rooted in and Responsible to the Community
- **Locally Owned**  
Cooperative, First Nation, Farmer-Owned
- **Commercial-Scale Generation**
- **Small Projects Making a Big Difference**

# Era of Distributed Generation

- Here Now
- Resilient, Not Brittle
- Short Lead Times
- Near Load, Less Losses
- Opportunity for Many
- Fosters Energy Awareness



Alberta, Canada



Ontario, Canada



# Distributed Wind Energy



Paul Gipe, [wind-works.org](http://wind-works.org)

**Hohe Westerwald, Germany**



# Distributed Wind Energy

**Wisconsin, USA**

**Michigan, USA**



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# Distributed Wind Energy

Thy, Denmark



Paul Gipe, [wind-works.org](http://wind-works.org)

# Kennemerwind Co-op

## Noord Holland

- 18 x 80 kW
- 10 Owned by Co-op
- 650 Members
- 1.5-2 Million kWh/yr





# Wieringemeer Noord Holland

- 5 x 600 kW
- Co-owned

1/2 by Two Farmers

1/4 by NEG-Micon

1/4 by Utility

# Sydthy Kabelaug Denmark

- 16 km of Buried Cable
- Direct to HV Network
- 26 x V27s (225 kW)
- ~1 Million kWh/unit
- Mostly Pig Farmers



# Danish Co-ops

(*Vindmøllelaug or Fællesmølle*)

- 1/4 Capacity Nationwide
- ~ \$1.7 Billion
- 100,000 Households Own Shares
- 5% of Population



Thyborøn-Harboøre Vindmøllelaug

Anton Bro

Paul Gipe, [wind-works.org](http://wind-works.org)



# Lynetten Co-op København

- 7 x 600 kW
- 4 Owned by Co-op
- 3 Owned by Municipal Utility

# Middelgrunden Co-op København

- 20 x 2 MW Off-shore
- 1/2 Owned by Co-op
- 1/2 Owned by Utility
- 8,500 Investors
- €570 per Share
- Visible from Christiansborg Palace





# German Co-ops (*Bürgerbeteiligung*)

- 1/3 Capacity Nationwide
- €4,000 Million
- 200,000 Own Shares
- 2/3 Schleswig-Holstein
- 4/5 Nordfriesland Amt



# Paderborn Co-op

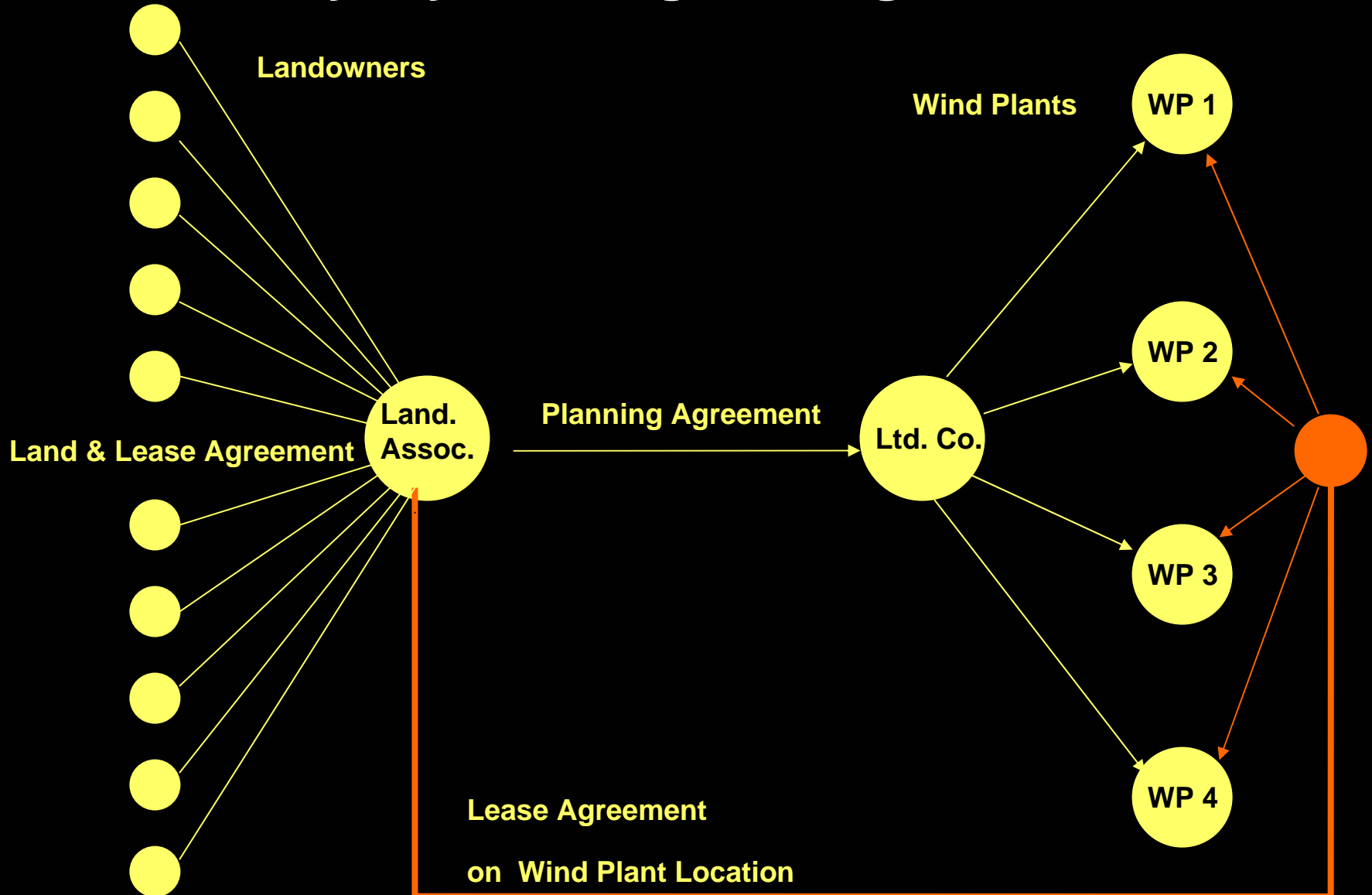
Enercon E66



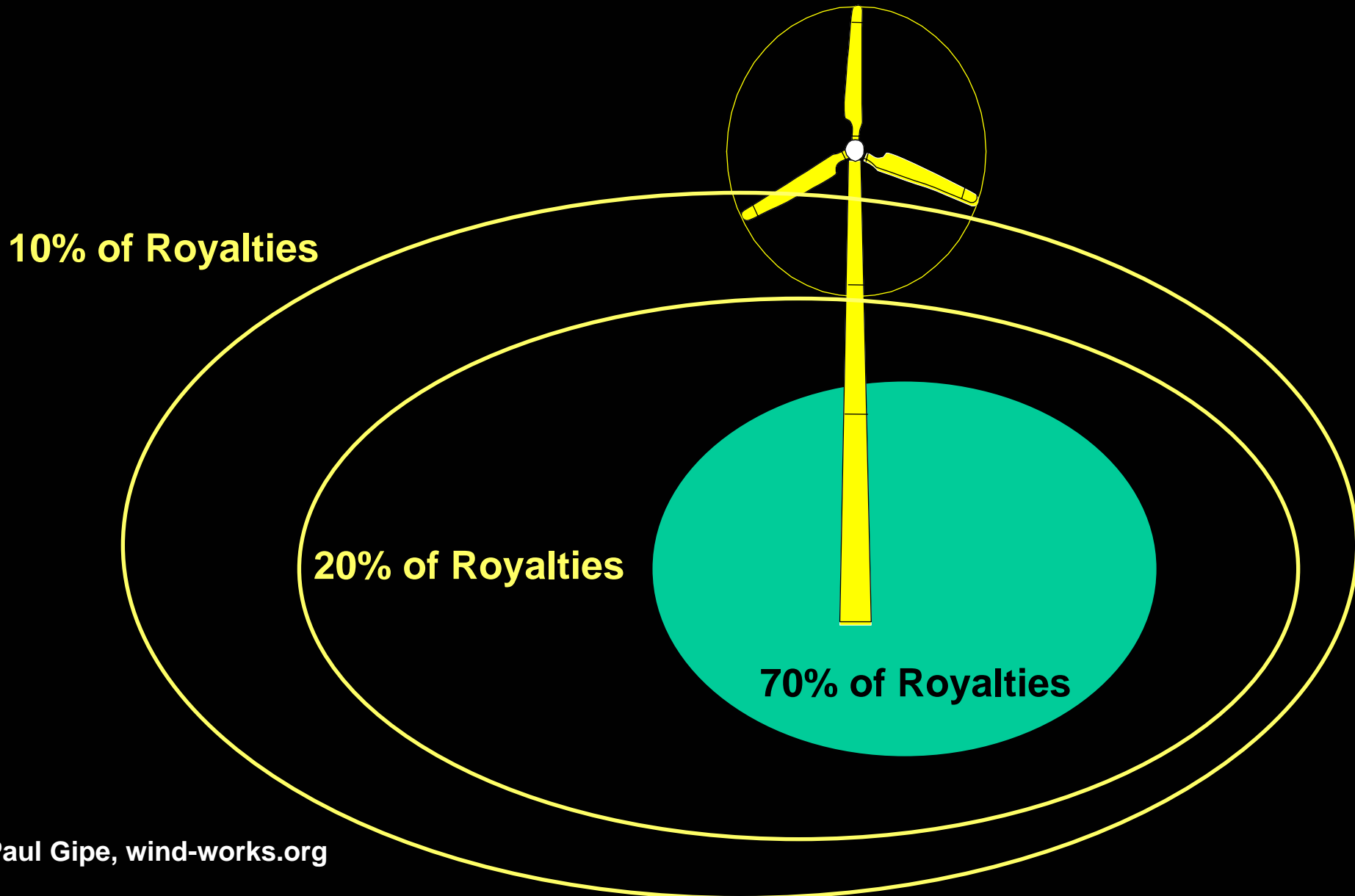
- 4 Wind Plants
- 17 Companies
- 80 x V66 & E66
- 110 MW
- €140 Million
- 780 ha (2,000 ac)
- All Companies Local  
Paying Local Taxes

# Paderborn Co-op

## Royalty Sharing Among Farmers



# PEI Royalty Revenue Sharing





# Co-Op & Farmer-Owned Wind

	Farmer	Co-op	Corporate
<b>The Netherlands</b>	<b>60%</b>	<b>5%</b>	<b>35%</b>
<b>Germany</b>	<b>40%</b>	<b>10%</b>	<b>50%</b>
<b>Denmark</b>	<b>65%</b>	<b>25%</b>	<b>10%</b>
<b>Spain</b>	<b>0%</b>	<b>0%</b>	<b>100%</b>

Source: Dave Toke, University of Birmingham, 2005.

# Community Wind--The Third Way

## Is North America Being Left Behind?

- No  
Time to Get It Right
- It's Not Easy Here  
Frustrating? Yes!
- Only the Beginning  
Minnesota  
Ontario



# Distributed Wind Energy in North America

- **Niche Market?**
- **Major Potential?**
- **Upper Midwest**  
Minnesota & Iowa
- **Southern Plains**  
Texas--Yes, Texas!
- **Canada**  
Nova Scotia  
Ontario--Slow Start
- **John Deere**







# Michigan

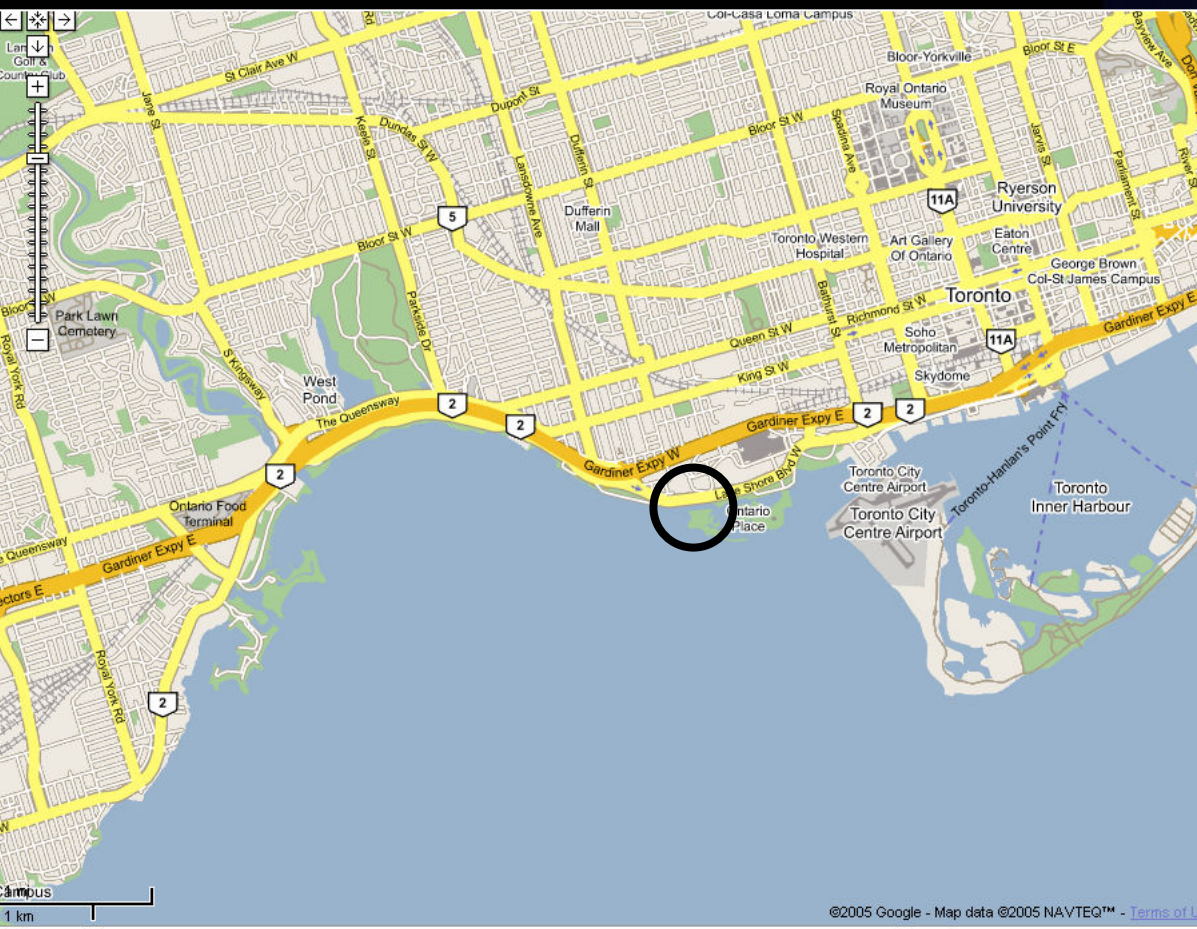
- **More Like Germany than Texas**
  - Population Density
  - Farm Size
  - Settlement Patterns
- **Projects More Like Germany than Texas?**
  - Smaller Projects
  - Clusters of Turbines
  - Single Turbines

# WindShare Toronto, Canada

- **First Urban Turbine in N.A.**
- **Co-Owned**  
WindShare Co-op  
450 Members  
Toronto Hydro
- **Prominent Location**
- **Highly Visible**
- **Highly Popular**



# WindShare Toronto, Canada



Paul Gipe, wind-works.org



# Toronto WindShare

## North America's First Urban Wind Turbine

### How The Turbine Works



# Aesthetic Guidelines:

**Design As If People Matter**





# Increasing Acceptance #2

- **Minimize Wind's Footprint**  
Physical--Roads, Foundations, Buildings  
Environmental & Visual
- **Seek Harmony**  
with Neighbors & the Environment
- **Wind as a part of the Landscape**
- **Not a Wind Landscape**  
as in California





# Public Opinion Surveys

- **“Beauty is in the Eye of the Beholder”**  
True, But Most People Agree on “Beauty”
- **Broad Support ~ 70%-90%**  
On Both Sides of the Atlantic
- **In the Abstract!**  
Benefits Global  
Impacts Local

# Provide Visual Uniformity





# Keep Them Spinning





# Keep Them Clean

**Use a Drip Pan or a Diaper  
(Nappie)**



# Bury All Intra-Project Lines





Montefalcone, Italy

# Bury All Intra-Project Lines





# Avoid “Industrialization”



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# Minimize Roads

- Use Existing Roads
- Use Existing Tracks
- Minimize Width
- Minimize Radius
- Harden Where Needed





# Harmonize Structures

With Other Structures on Landscape

Buildings



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# Harmonize Structures

## Buildings



# No Billboards





# No Logo!

## Or Subtle Logo Only

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# Revegetate Site





A photograph of a wind turbine on a grassy hill under a blue sky. In the foreground, a green transformer is enclosed in a chain-link fence. The text 'Eliminate Fencing' is overlaid in large white letters.

# Eliminate Fencing

**Sends the Wrong Message  
...“Keep Out, Danger”**

# Use White, Off-White, or Gray





# Avoid Garish Patterns

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Tvind, Denmark, 2005

# Keep Sites Tidy





# Inform Public

## Simpler is Better



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# Provide Access



# In Sum . . . Be A Good Neighbor





# **Wind Energy is Compatible With Most Existing Land Uses ... With Rural Residential**



**Yorkshire, England**



# ... With Row Crops



Noordoost Polder, the Netherlands

# ... With Grazing

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Thyborøn-Harboøre Vindmøllelaug

**. . . With Harbors**



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# ... With Commercial Uses





# ... With Schools



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Forest City, Iowa

# ... With Religious Sites



**Montefalcone, Italy**

**Paul Gipe, [wind-works.org](http://wind-works.org)**



**White Deer, Texas**



# ... With Some Parks

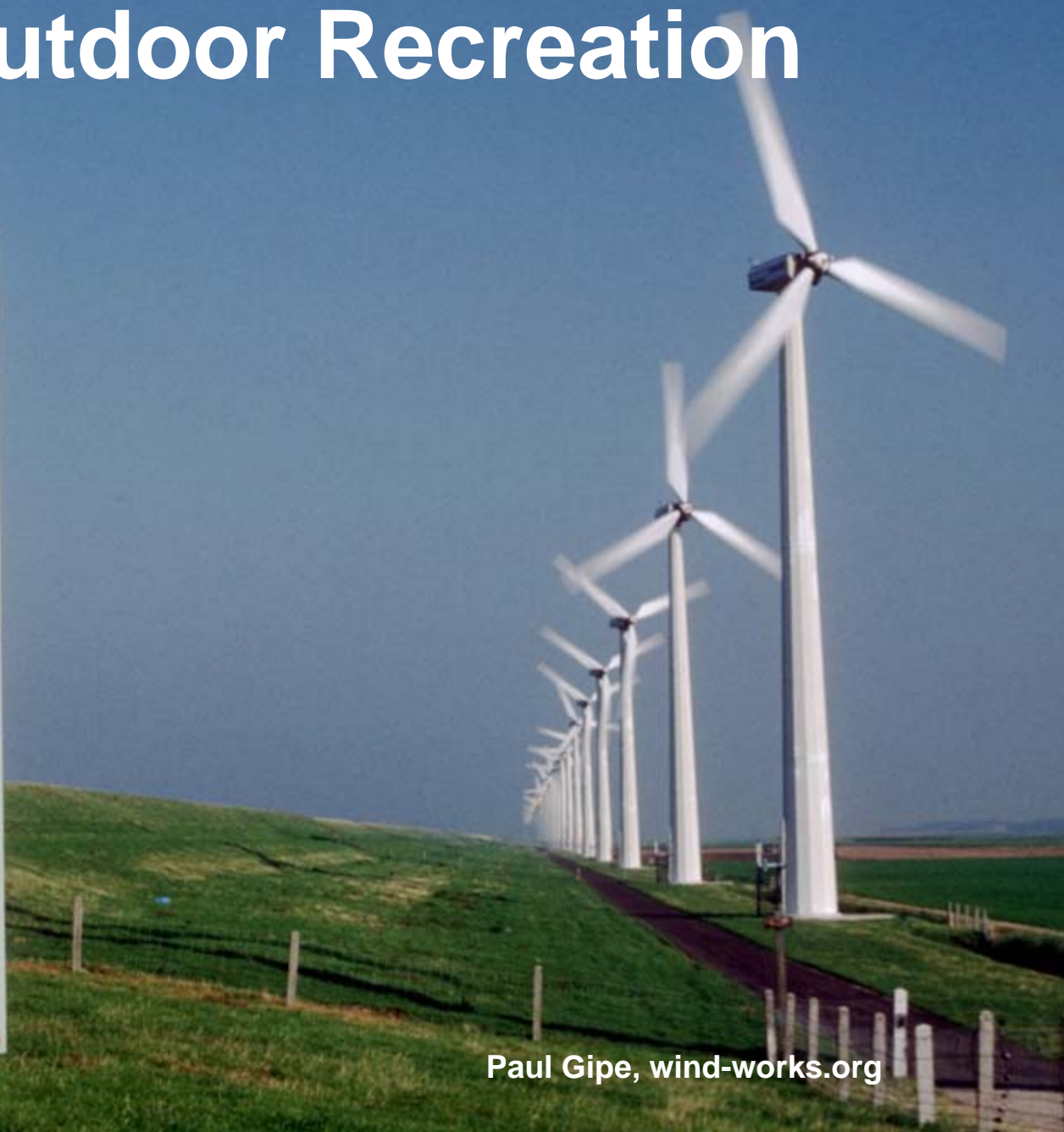
Depending Upon the Level of Protection



Wellington (Brooklyn), NZ



# ... With Outdoor Recreation





Lille Havfrue, København

# ... With Tourism



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# ... With Cycling



# ... With Walking & Jogging

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Dunkerque, France



Tehachapi Pass, California

# ... With Hiking (Rambling)





# Community Wind is About People and Opportunity





# Community Power

- Greater Acceptance
- More Power More Quickly
- More People Involved Locally
- More Money Locally
- More Jobs Locally

# Community Wind--The Third Way

## Technology for Life\*

Paul Gipe, [wind-works.org](http://wind-works.org)

\*from N.F.S. Grundtvig

